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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,822	10/30/2003	Yoshihiro Iwashita	117640	7183
25944	7590	07/20/2005		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER CHANG, CHING	
			ART UNIT 3748	PAPER NUMBER
DATE MAILED: 07/20/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/695,822

Applicant(s)

IWASHITA ET AL.

Examiner

Ching Chang

Art Unit

3748

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5-7,9,10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7,9,10, and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)          |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. <u>05262005</u> .                                    |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____.  | 6) <input type="checkbox"/> Other: _____.                                   |

### DETAILED ACTION

This Office Action is in response to the amendment filed on 05/12/2005.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. ***Claims 1, 3, 5-6, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whiting et al. (US Patent 6,347,619) in view of Born (US Patent 5,515,818), and further in view of Byrant (US Patent 6,279,550).***

Whiting discloses a device (60) for controlling an internal combustion engine with a variable valve system (56) wherein, while a piston (48) of the engine descends during an expansion stroke in a cylinder of the engine, an intake valve (18) is opened such that intake air is supplied into the cylinder from the engine intake system (36, 38), and pressure in the cylinder is lowered by opening an exhaust valve (16, 20) at an initial stage of the expansion stroke by the variable valve system for the exhaust valve (See Figs. 3 and 5); wherein, when the pressure in the cylinder becomes lower than atmospheric pressure, said intake valve is opened such that the intake air is supplied into the cylinder from an air intake system of the engine.

Whiting discloses the invention as recited above, however, fails to disclose the intake valve being opened by an electromagnetic actuator.

The patent to Born on the other hand, teaches that it is conventional in the electromechanical variable valve actuator art, to utilize an electromechanical variable valve actuator (20-20E) for selectively opening and closing an engine intake valve.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized an electromagnetic actuator to operate the intake valve as taught by Born in the Whiting device, since the use thereof would provide an improved engine with a more controllable intake valve system.

The modified Whiting device discloses the invention, however, fails to disclose the exhaust valve being opened before the intake valve is opened during a piston expansion stroke.

The patent to Bryant on the other hand, teaches that it is conventional in the engine art, to utilize an engine control strategy to open the exhaust valve before the intake valve is opened during a piston expansion stroke (See Col. 30, line 32 through Col. 36, line 34), in a 2-stroke operation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the control strategy opening the exhaust valve before the intake valve is opened during a piston expansion stroke as taught by Bryant in the modified Whiting device, since the use thereof would provide a better engine valve timing control device, to improve the fuel economy and reduce the engine emissions.

3. ***Claims 1, 3, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (US Patent 5,398,502) in view of Bryant (US Patent 6,279,550).***

Whiting discloses a device (50) for controlling an internal combustion engine with a variable valve system (30) wherein, while a piston (4) of the engine descends during an expansion stroke in a cylinder of the engine, an intake valve (11) is opened by the variable valve system for the intake valve such that intake air is supplied into the cylinder from the engine intake system (16, 15, 14), and pressure in the cylinder is lowered by opening an exhaust valve (13) at an initial stage of the expansion stroke by the variable valve system for the exhaust valve (See Fig. 8); wherein, when the pressure in the cylinder becomes lower than atmospheric pressure, said intake valve is opened by said variable valve system for the intake valve such that the intake air is supplied into the cylinder from an air intake system of the engine.

Watanabe discloses the invention as recited above, however, fails to disclose the exhaust valve being opened before the intake valve is opened during a piston expansion stroke.

The patent to Bryant on the other hand, teaches that it is conventional in the engine art, to utilize an engine control strategy to open the exhaust valve before the intake valve is opened during a piston expansion stroke (See Col. 30, line 32 through Col. 36, line 34), in a 2-stroke operation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the control strategy opening the exhaust valve before the intake valve is opened during a piston expansion stroke as taught by Bryant

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in the Watanabe device, since the use thereof would provide a better engine valve timing control device, to improve the fuel economy and reduce the engine emissions.

**4. Claims 6, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Byrant (as applied to claims 1, 3 and 5 above), and further in view of Born (US Patent 5,5515,818).**

The modified Watanabe device discloses the invention, however, fails to disclose the said variable valve system being an electromagnetic actuator.

The patent to Born on the other hand, teaches that it is conventional in the electromechanical variable valve actuator art, to utilize an electromechanical variable valve actuator (20-20E) for selectively opening and closing an engine intake or exhaust valve.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized an electromagnetic actuator to operate the intake valve as taught by Born in the Whiting device, since the use thereof would provide an improved engine with a more controllable intake valve system.

**5. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Byrant (as applied to claim 1), and further in view of Mori (US Patent 5,5515,818).**

The modified Watanabe device discloses the invention, however, fails to disclose secondary air being required in an exhaust system of the engine.

The patent to Mori on the other hand, teaches that it is conventional in the engine art, to utilize secondary air (through 1, 2, 3) for an engine exhaust system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the secondary air supplied to the engine exhaust system as taught by Mori in the modified Watanabe device, since the use thereof would provide an improved engine with more purified exhaust gas emissions.

**6. *Claims 2, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whiting in view of Born, and further in view of Byrant (as applied to claims 1-2), and further in view of Mori (US Patent 5,5515,818).***

The modified Whiting device discloses the invention, however, fails to disclose secondary air being required in an exhaust system of the engine.

The patent to Mori on the other hand, teaches that it is conventional in the engine art, to utilize secondary air (through 1, 2, 3) for an engine exhaust system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the secondary air supplied to the engine exhaust system as taught by Mori in the modified Whiting device, since the use thereof would provide an improved engine with more purified exhaust gas emissions.

**7. *Claims 1, 3, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (US Patent 5,398,502) in view of Macor et al.(US Patent 6,237,551).***

Watababe discloses a device (50) for controlling an internal combustion engine with a variable valve system (30) wherein, while a piston (4) of the engine descends during an expansion stroke in a cylinder of the engine, an intake valve (11) is opened by the variable valve system for the intake valve such that intake air is supplied into the cylinder from the engine intake system (16, 15, 14), and pressure in the cylinder is lowered by opening an exhaust valve (13) at an initial stage of the expansion stroke by the variable valve system for the exhaust valve (See Fig. 8); wherein, when the pressure in the cylinder becomes lower than atmospheric pressure, said intake valve is opened by said variable valve system for the intake valve such that the intake air is supplied into the cylinder from an air intake system of the engine.

Watanabe discloses the invention as recited above, however, fails to disclose the exhaust valve being opened before the intake valve is opened during a piston expansion stroke.

The patent to Macor on the other hand, teaches that it is conventional in the multiple-cylinder diesel engine art, to utilize an engine control strategy to open the exhaust valve before the intake valve is opened during a piston expansion stroke (See Fig. 9), in a 2-stroke operation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the control strategy opening the exhaust valve before the intake valve is opened during a piston expansion stroke as taught by Macor



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in the Watanabe device, since the use thereof would provide a better engine valve timing control device, to reduce the engine exhaust emissions.

**8. Claims 1, 3, 5-6, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whiting et al. (US Patent 6,347,619) in view of Born (US Patent 5,515,818), and further in view of Macor et al. (US Patent 6,237,551).**

Whiting discloses a device (60) for controlling an internal combustion engine with a variable valve system (56) wherein, while a piston (48) of the engine descends during an expansion stroke in a cylinder of the engine, an intake valve (18) is opened such that intake air is supplied into the cylinder from the engine intake system (36, 38), and pressure in the cylinder is lowered by opening an exhaust valve (16, 20) at an initial stage of the expansion stroke by the variable valve system for the exhaust valve (See Figs. 3 and 5); wherein, when the pressure in the cylinder becomes lower than atmospheric pressure, said intake valve is opened such that the intake air is supplied into the cylinder from an air intake system of the engine.

Whiting discloses the invention as recited above, however, fails to disclose the intake valve being opened by an electromagnetic actuator.

The patent to Born on the other hand, teaches that it is conventional in the electromechanical variable valve actuator art, to utilize an electromechanical variable valve actuator (20-20E) for selectively opening and closing an engine intake valve.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized an electromagnetic actuator to operate the intake

valve as taught by Born in the Whiting device, since the use thereof would provide an improved engine with a more controllable intake valve system.

The modified Whiting device discloses the invention, however, fails to disclose the exhaust valve being opened before the intake valve is opened during a piston expansion stroke.

The patent to Macor on the other hand, teaches that it is conventional in the engine art, to utilize an engine control strategy to open the exhaust valve before the intake valve is opened during a piston expansion stroke (See Fig. 9), in a 2-stroke operation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the control strategy opening the exhaust valve before the intake valve is opened during a piston expansion stroke as taught by Macor in the modified Whiting device, since the use thereof would provide a better engine valve timing control device, to reduce the engine exhaust emissions.

9. ***Claims 6, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Macor (as applied to claims 1, 3 and 5 above), and further in view of Born (US Patent 5,5515,818).***

The modified Watanabe device discloses the invention, however, fails to disclose the said variable valve system being an electromagnetic actuator.

The patent to Born on the other hand, teaches that it is conventional in the electromechanical variable valve actuator art, to utilize an electromechanical variable

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valve actuator (20-20E) for selectively opening and closing an engine intake or exhaust valve.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized an electromagnetic actuator to operate the intake valve as taught by Born in the Whiting device, since the use thereof would provide an improved engine with a more controllable intake valve system.

**10. *Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Macor (as applied to claim 1), and further in view of Mori (US Patent 5,5515,818).***

The modified Watanabe device discloses the invention, however, fails to disclose secondary air being required in an exhaust system of the engine.

The patent to Mori on the other hand, teaches that it is conventional in the engine art, to utilize secondary air (through 1, 2, 3) for an engine exhaust system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the secondary air supplied to the engine exhaust system as taught by Mori in the modified Watanabe device, since the use thereof would provide an improved engine with more purified exhaust gas emissions.

### ***Response to Arguments***

**11.** Applicant's arguments with respect to claims 1-3, 5-7, 9-10, and 12 have been considered but are moot in view of the new ground(s) of rejection.

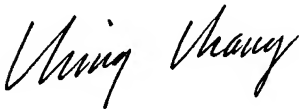
**Conclusion**

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ching Chang whose telephone number is (571)272-4857. The examiner can normally be reached on M-Th, 7:00 AM -5:00 PM.

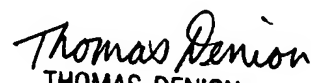
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571)272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patent Examiner



Ching Chang



THOMAS DENION  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700